

Board of Studies in Geology
FACULTY OF SCIENCE
GONDWANA UNIVERSITY, GADCHIROLI

Syllabus of

B.Sc. Third Year (Semester Pattern)

SUBJECT - GEOLOGY

Semester VI

Semester VI Geology Paper I (Structural Geology)

Unit I

Scope and aim of Structural Geology, Concept of rock deformation: Types of forces, stress and strain. Stereographic projections and its use in structural analysis. Compass clinometers and its parts, method of using the instrument. Study of outcrops, identification of bedding, data, measurement. Dip, Strike, Rake, Plunge and their measurements.

Unit II

Outcrops and their relationship with topography. Overlap (Offlap and Onlap). Erosional structures: Inlier and Outlier, Klippe and Fenster, Synclinal hill and Anticlinal valley. Unconformities : kinds, geological significance and their recognition. Diapirs (salt domes).

Unit III

Structural elements- planar and linear. Folds: definition, style, orientation, morphology geometric and genetic classification. Effects of folding on outcrops. Joints: Definition, geometric and genetic classification of joints.

Unit IV

Faults: definition, geometric and genetic classification of faults, effects of faulting on outcrops. Recognition of faults in the field. Foliation: descriptive terminology, kinds, origin and relation to major structures. Lineation: descriptive terminology, kinds, origin and relation to major structures. Map symbols for above structural features. Shear zones: ductile and brittle shear zones.

Books recommended:

1. Billings: Structural Geology.
2. Hills: Outline of Structural Geology.
3. Hobbs, Mcans and Williams: Outline of Structural Geology.
4. Suppe: Principles of Structural Geology.
5. Park: Fundamentals of Structural Geology.
6. Gokhale: Theory of Structural Geology.
7. Gokhale: A manual of problems of Structural Geology.
8. Mathur: A Guide to Field Geology.
9. Compton: Manual of Field Geology.
10. Lahi: Field Geology.
11. Gokhale: Guide to Field Geology.
12. Butler and Bell: Interpretation of Geological Maps.
13. Phillips: The use of Stereographic projections in Structural Geology.
14. Roberts: Introduction to Geological maps and structures.
15. Ragan: Structural Geology: An introduction to geometric techniques.
16. Bolton: Geological Maps: Their solution and interpretation

Paper II

(Elementary Hydrogeology and Environmental Geology)

Unit I

Definition of Precipitation, percolation, runoff, evaporation and transpiration Hydrologic cycle. Occurrence and distribution of groundwater. Zones of aeration and saturation, water table, cone of depression and recharge. Influent and effluent seepages and springs.

Elementary ideas about groundwater flow.

Unit II

Hydrologic properties of rocks. Hydrogeologic characteristics of different types of rocks. Aquifers and their classification. Groundwater provinces of India. Groundwater conditions in different parts of Maharashtra. Concept of watershed management.

Unit III

Definition and concept of Environmental Geology. Natural hazards such as earthquakes, landslides floods, volcanic activity, coastal erosion, desertification and their impact on environment. Soil types, soil degradation and mitigation, soil pollution.

Unit IV

Concepts of natural ecosystems on the earth and their mutual interrelations and interactions (atmosphere, hydrosphere, lithosphere and biosphere). Environmental changes due to human dominated environment over nature dominated system. Environmental considerations in the constructions of large dams, reservoirs, and tunnels. Pollution: its effect on natural ecosystem and anti- pollutional measures (water and air)

Books recommended:

Hydrogeology:

1. Todd: Ground water Hydrology
2. Karanth: Hydrogeology
3. Nagabhushaniah : Groundwater in Hydrosphere (Groundwater hydrology)
4. Karanth: Groundwater Assessment, Development and Management

Environmental Geology:

1. Valdiya: Environmental Geology
2. Miller: Sustaining the Earth
3. Foley, Duncan, McKenzie and Utgard: Investigations in Environmental Geology
4. Keller : Environmental Geology
5. Bell: Geological Hazards.
6. Coats: Environmental Geology

Practicals:

Structural Geology:

Reading a geological map and the symbols used. Exercises on geological maps showing bedding, unconformities, folds, faults and intrusive. Completion of outcrop maps (minimum of 15 maps). Problems based on true dip and apparent dip, three point problems, and determination of thickness and depth of the beds. Stereographic projections of structural data. Drawing of geological sections and interpretation of geology and geological history (10 to 15 maps)

Field work:

Field work shall be treated as a part of practical examination of semester VI and Marks are assigned on it. Every student should attend field work for a short duration and submit field diary, geological specimen and a report. Field report shall be assessed by teacher and Head of the Department.